EXTENSION WORKERS' COCOA (THEOBROMA CACAO) PRODUCTION TECHNOLOGY DISSEMINATION CONSTRAINTS IN EDO STATE, NIGERIA: IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT COMMUNICATION

Okoedo-Okojie D. U. [a], M. J. Koyenikan [b]
[a, b] Department of Agricultural Economics and Extension Services,
University of Benin, Benin City, Edo State, Nigeria.
Corresponding author email: ibhadedavid@yahoo.com

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Abstract: The study assessed extension workers' perception of technology dissemination constraints in Cocoa production in Edo State, Nigeria. The forty seven (47) extension agents in position constituted the respondents for the study. Data were gathered with the aid of structured questionnaire and analysed using frequency and means as well as Pearson Product Moment Correlation (PPMC) to test relationships. Results showed that majority (78.7%) of the respondents were males and had working experience of between 6 and 10 years (53.2%). Most (95.7%) and (85.1%) sourced technology on hybrid variety and disseminated fertilizer technology respectively. The respondents perceived that they were mostly efficient in communicating/disseminating Cocoa hybrid variety (mean = 3.51) and were constrained by too much work load/areas to cover (mean= 3.85). Only age and grade level were significantly related to respondents' perception of technology communication. It was recommended that seminars and workshops to impart communication skills for innovation dissemination in sustainable development be organised for extension workers regularly.

Keywords: Cocoa; Constraints; Communication; Extension Workers; Technologies.

INTRODUCTION

In Nigeria, no single agricultural export commodity has earned more than cocoa in terms of foreign exchange earnings; with respect to employment, the cocoa sub-sector still provides employment to a sizeable number of people both directly and indirectly, it is also an important source of raw materials, as well as source of revenue to governments of cocoa producing states [1]. [2] noted that as a result of its importance, the recent federal government's concern of diversifying the export base of the has however shown that the growth rate of cocoa production has been declining, which has given rise to a fall nation has placed cocoa in the centre-stage as the most important export tree crop. Evidence in the fortunes of the sub-sector as [3] noted that cocoa production in Nigeria witnessed a downward trend after 1971 season, when its export declined to 216,000 metric tons in 1976, and 150,000 metric tons in 1986, therefore reducing the country's market share to about 6% and to fifth largest producer to date This decline in growth rate of cocoa production could be attributed to non use of proven technologies and practices by farmers. Modern day agriculture is characterized by lots of innovation and improved practices. The practices are mostly generated from agricultural research institutions and to be disseminated through the agricultural extension institutions. However, most agricultural practices in use by most farmers remain largely primitive and underdeveloped. This indicates a situation of information gap between the generators and the prospective end users of these technologies and practices. This is because two essential elements drive human development; people's will to change

and the relevant information, in this instance- through extension service, in support of change process [4]. Extension service constitutes the process whereby the extension worker tries to motivate the clientele to give him the idea to solve his problem. It can also be seen as a process of finding ways of making the encounter between the extension worker and the farmer meaningful such that they will be capable of creating solutions by their own efforts [5]. Extension agents play the role of disseminating proven technologies to farmers [6]. According to [7], for effective cocoa production, certain technologies and practices must be used; these technologies include the use of improved varieties, coppicing, fertilizers, agrochemicals, as well as irrigation facilities. However, the problem is that most people have vague ideals of the potentials of the industry and as such are sometimes slow in committing investment fund into the sub sector. Beyond this, certain constraints limit farmers and even extension agents in the sector. Constraints could either be in the form of technology sourcing and dissemination by extension agents or technology adoption [8]. According to [9] the performance of the extension agents determines the productivity of farmers and extension organization in general. Hence the role of extension delivery which is actualised by the extension workers through technology dissemination to farmers is an issue in the attainment of sustainable development through the sub sector.

The broad objective of this study is to examine extension workers perception of technology dissemination constraints in cocoa production in Edo State, Nigeria. The specific objectives were to examine the personal characteristics of extension workers; ascertain cocoa technologies sourced and disseminated by respondents; examine the respondents' perceived effectiveness of disseminating cocoa technologies, their perceived improvement strategies for sourcing and disseminating technologies and examine constraint encounter by extension workers in disseminating technologies. A null hypothesis formulated for the study is that there is no significant relationship between socio-economic characteristics of extension workers and their perceived constraints in disseminating proven technologies and practices to cocoa farmers.

METHODOLOGY

The study was conducted in Edo State, Nigeria. The choice of Edo State was informed by the Cocoa Research Institute of Nigeria (CRIN) substation, Uhunmora located in Owan Local Government Area (LGA). Twenty (20) extension agents from CRIN Uhunmora and twenty seven (27) extension agents from the Edo State Agricultural Development Programme (ADP) were selected for the study. This gave a total of 47 respondents. Data were solicited with the aid of questionnaire and validated by expert judgement. Cocoa technologies sourced from research and disseminated to farms was measured in percentage while effectiveness of dissemination of technology and dissemination constraints were measured in a 4-point rating scale of very effective coded 4, effective coded 3, little effective coded 2, not effective coded 1, while for constraints very serious was coded 4, serious coded 3, not serious coded 2, and not a problem coded 1. A mean score of 2.50 and above was taken to mean that respondents were effective in disseminating a particular technology and considered a particular constraint serious respectively. Hypothesis was tested using Pearson Product Moment Correlation (PPMC).

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

Entries in Table 1 showed that majority (78.7%) of the respondents were males. This may indicate that there are more male cocoa farmers than female, as proven technologies are easily shared among individuals of same sex. This confirms the findings of [10] that male extension workers, in principle, interact with only male farmers while female workers interact with female farmers. A higher proportion (48.9%) of the respondents were between 30 and 39 years with a mean age 35 years, an indication that the extension agents are relatively young and would be zealous to source and disseminate proven technologies. Majority (61.7%) of the respondents are married, an indication that they are socially responsible persons, hence, this characteristic could positively affect dispatch of their roles as extension agents. Higher proportions (53.2%) of the respondents are permanent staff and have job experience of between 6 and 10 years respectively, with a mean working experience of 6.5 years. This status may imply that extension agents will be dedicated to the job they do and also implies that the extension agents are fairly experienced in their job. Table 1 further showed that 53.2% of the respondents occupy job position of extension agents; this is expected as this is the position of field staff that has direct contact with farmers at cell/ community level. A higher proportion (46.8%) of the respondents secondary school leavers, followed by holders of OND 34.0%. this level of education coupled with experience may imply that respondents would be able to appreciate the various constraints that are imminent in cocoa production as it borders on dissemination of proven technologies.

Table 1: Socio-Economic Characteristics of Respondents

CHARACTERISTICS		FREQUENCY (n=47)	PERCENTAGE	MEAN
Sex:	Female	10	21.3	
	Male	37	78.7	
Age(years):	<30	14	29.8	
	30-39	23	48.9	
	40-59	5	10.6	
	≥60	5	10.6	35.0
Marital Status:	Single	16	34.0	
	Married	29	61.7	
	Others	2	4.3	
Job Status:	Temporary	19	40.4	
	Permanent	28	59.6	
Job Position:	BEA	20	42.6	
	ZEO	4	8.5	
	CEO	1	2.1	
	EA	25	53.2	
Job Experience(years):	<5	16	34.0	
	6-10	25	53.2	
	11-15	4	8.5	
	≥16	2	4.3	6.5
Educational Qualification:	JSS/SSS	22	46.8	
	OND	16	34.0	
	HND/BSc	8	1.0	
	MSc	1	2.1	
	PhD			
Grade Level:	<6	20	42.6	
	6-14	19	40.4	
	≥15	8	17.0	8

Source: Computed from Field Survey, 2012

Table 2: Distribution of Respondents by Cocoa Technologies Sourced and Disseminated

Technologies	Sourced from research		Disseminated to farmers	
	*Frequency	Percentage	*Frequency	Percentage
Hybrid Variety	44	93.6	38	80.9
Agrochemicals	43	91.5	40	85.1
Aerial spray	38	80.9	32	68.1
Smoking kiln	42	89.4	40	85.1
Fertilizer	41	87.2	40	85.1
Harvester	45	95.7	39	83.0
Irrigation facilities	37	78.7	32	68.1
Tree intercropping	40	85.1	32	68.1
Fermentation machine	41	87.2	30	63.8
Coppicing	36	76.6	28	59.6
Poly bag	42	89.4	38	80.9
Ring weeding	41	87.2	32	68.1
Sprouted seeds	39	83.0	38	80.9
Biofuel	32	68.1	15	31.9

Source: Computed from Field survey, 2012 *Multiple responses

Table 3: Mean Distribution of Respondents by Effectiveness of Disseminated Cocoa

Technologies	Mean	Standard Deviation
Hybrid variety	3.51*	0.856
Agrochemicals	3.15*	0.884
Aerial spray	2.57*	1.016
Smoking kiln	2.49	1.061
Fertilizer	2.91*	1.265
Harvester	2.70*	1.082
Irrigation facilities	2.55*	1.039
Tree intercropping	2.96*	1.179
Fermentation machine	2.79*	0.931
Coppicing	3.15*	1.179
Poly bag	2.87*	1.115
Ring weeding	3.00*	1.161
Sprouted seeds	3.17*	1.007
Biofuel	2.28	1.077

Source: Computed from Field Survey, 2012 *Effective (mean≥2.50)

Table 4: Improvement Strategies of Technology Sourcing and Dissemination

	COCOA	
	*Frequency	Percentage
Workshops and seminars to train extension staff on new technologies	47	100.0
Regular in-service trainings of extension agents	47	100.0
Incentives for extension agents to respond to feedback from farmers to research	47	100.0
Regular availability of inputs	47	100.0
Use of many communication and information sources	47	100.0

*Multiple responses

Cocoa Technologies Sourced and Disseminated by Respondents

Table 2 showed that most (95.7%) of the extension agents sourced harvester technologies from research. This is followed by hybrid variety with 93.6%, and agrochemicals 91.5%. The result also established that agrochemical, smoking kiln and fertilizer has the highest (85.1%) dissemination status. Hence, it did not follow that technologies mostly sourced from research were mostly disseminated to farmers. This could be as a result of the fact that the technologies with higher dissemination status are being more frequently sourced by farmers, as these technologies being part of routine management practices.

Perceived Effectiveness of Dissemination of Cocoa Technologies

Table 3 shows the mean distribution of effectiveness in disseminating cocoa technologies. The result showed that of all the 14 disseminated technologies, 12 were perceived as effectively disseminated , with hybrid cocoa variety ($M \geq 2.50$) as the most effectively disseminated, followed by coppicing and agrochemical (M=3.15). It means that farmers are likely to adopt technologies that are effectively disseminated.

Improvement Strategy for Technology Sourcing and Dissemination

Table 4 below shows that in cocoa production, all (100%) extension agents think that all five strategies should be used to improve technology sourcing and dissemination. This shows that cocoa extension agents are willing to improve on their skills in technology dissemination and sourcing.

Technologies Dissemination Constraints

Results on table 5 show the constraints faced by cocoa extension agents in technology dissemination. Extension agents perceive all constraints as serious (mean>2.5). The most serious constraints as perceived by cocoa extension agents was too much areas to be covered by extension staff (mean=3.8). So farmers will not be effectively reached with technologies.

Relationship between Personal Characteristics of Extension Agents and Their Perception of Constraints in Disseminating Proven Cocoa Technologies

Age ($r=-0.475$ $P<0.01$) and grade level ($r=-0.333$ $P<0.05$) were the variables that were significant at 0.050 level. The negative sign for grade level means that extension agents in the lower grade levels experienced and perceived more constraints in technology dissemination. This result could be expected as respondents with higher grade levels would have acquired enough experience and information to effectively disseminate technologies. The negative correlation in age implies that younger extension agents perceive more constraints in technology dissemination.

Implications for sustainable development communication

Findings revealed that extension workers experienced severe constraints in cocoa technology dissemination. This could be greatly reduced, if their perception of constraints in extension work are revealed.

Table 5: Technology Dissemination Constraints by Extension Agents

CONSTRAINTS	COCOA	
	Mean	**Standard deviation**
Inadequate of motivation from employer	3.47*	0.881
Gender roles	3.72*	0.800
Inactive participation of extension staff in development programmes	3.70*	0.507
Ratio of extension staff to farmer is low	3.49*	0.953
Too much areas to be covered by extension staff	3.85*	0.625
Inadequate technical competency of extension agents	3.36*	1.051
Insufficient support from local government bodies	3.34*	1.006
Mismanagement of human resources (too much extension agents disseminating a single technology)	3.13*	3.13
Professional incompetence	2.96*	0.833

Source: Computed from Field Survey, 2012 *Serious (mean ≥2.50)

Table 6: Relationship between Personal Characteristics of Cocoa Extension Agents and Their Perception of Constraints in Disseminating Proven Technologies and Practices to Cocoa Farmers

	Technology Dissemination Constraints (total)	
	Correlation coefficient (r)	**Probability level**
Sex	0.070	0.641
Age	-0.475**	0.001
Job status	-0.118	0.430
Job experience	0.129	0.387
Educational qualification	0.058	0.698
Grade level	-0.333*	0.022

* correlation is significant at the 0.05 level

**correlation is significant at the 0.01 level

The central role of knowledge and its need for sustainable agricultural development; relationship between different communication strategies, functions and logistics co-ordinate actions for technology dissemination; and the need to anticipate diversity among farmers, this is because according to [11], when communication workers fail to tune in to the way farmers speak about certain issue, they are likely to talk about topics that are not the main concerns of farmers. This situation calls for training of the extension workers on the effect of communication on sustainable development in which extension agent will consistently take into account farmers' preference for communication channels.

The extension workers in dissemination of cocoa technologies to farmers can be assumed to be a cognitive agent, who have an excellent understanding of the principles to develop farmers and rural people in that different form of knowledge and cognition play a central role in technology management between basic and adaptive research. A situation that recognised the Agricultural Knowledge and Information System (AKIS) according to [12] is the articulated set of actors, networks and/or organisation expected or managed to work synergically to support knowledge processes which improve correspondence between knowledge and environment and/or the control provided through technology use in a given domain. This synergy is necessary for sustainable agricultural development through cocoa production-cocoa farmers, extension workers and the research institute. Sustainable agricultural development as it relates to cocoa production implies sustained improvement advances meant of growth in its production, disease control, improved cultural practices sources of market through dissemination of proven technologies to cocoa farmers by extension workers which will simultaneously enhance the standard of living of the people especially farmers this will include both small scale and commercial farmers. Consequently there will be reduction in unemployment and under employment, since a large proportion of the population will new become engaged in the production. This will also be reflected in increased gross domestic production of the economy and opportunity for export.

For contribution of cocoa to sustainable development, i.e. to check the downward trend in production as noted by [13], the Cocoa Research Institute of Nigeria (CRIN) and the Agricultural Development Programme (ADPs) should decide on appropriate communicative strategies. This calls for the need to have a thorough understanding of the social and technical bottle necks that exist in relation to specific issues in cocoa technologies dissemination.

CONCLUSIONS

This study concludes that extension workers are faced with constraints, these constraints negates their effort to disseminate proven cocoa technologies to farmers, and perceive "inadequate motivation from employer" as their most serious constraint.

Based on findings, the following recommendations are made: (a) Incentives should be introduced for extension workers for encouragement on the job. (b) More extension workers, especially female workers should be employed by CRIN and ADPs to check the issue of too much area to be covered by extension staff and to reach more female cocoa farmers with proven technologies. (c) Seminars and workshops on communication skills for innovation for sustainable development should be organised for extension workers regularly. (d) Extension workers should educate farmers on technologies that have low dissemination for now e.g. fermentation machine, coppicing, poly bag etc, as all technologies are important for sustainable development.

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ABOUT THE AUTHORS

Author 1
Name: Okoedo-Okojie, David U., Ph. D
Mailing Address: Dept of Agric. Economics & Extension Services, University of Benin, Benin- City, Nigeria
Tel: +234 8028804858
Email: Ibhadedavid@yahoo.com

Author 2
Name: Margaret J. Koyenikan, Ph. D
Mailing Address: Dept of Agric. Economics & Extension Services, University of Benin, Benin- City, Nigeria
Tel: +234 8034086325
e-mail: mkoyenikan@yahoo.com